1,167,690

PATENT SPECIFICATION

DRAWINGS ATTACHED

1,167,690

Inventors: EDWIN MERVYN ROWBOTHAM and LESLIE EVANS

Date of Application (No. 46211/68) and filing Complete Specification: 30 September, 1968.

Complete Specification Published: 22 October, 1969.

Index at Acceptance:—B5 A (1R14A, 1R14C1X, 1R14C2, 1R14D, 1R73).

International Classification:—B 32 b 15/08; 31/00.

COMPLETE SPECIFICATION

A Method of Making a Metal Coated Article

We, FORD MOTOR COMPANY LIMITED, of 88 Regent Street, London W.1., a British Company, do hereby declare the invention for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement.—

This invention relates to a method of making an article of plastics material with a metal coating.

There are many known processes for coating plastic articles with metal, for example, by electroless plating which may be followed by electroplating. A surface coating of metal may be required to improve the surface durability and finish or merely to provide the appearance of a solid metal article.

According to the invention a method of making a metal coated article includes:—

(a) coating a mould with a release layer;

(b) spraying a metal coating on the release layer;

(c) forming an article of plastics material in the mould; and

(d) releasing the article with a metal coating on its surface from the mould.

The release layer is necessary to protect the mould during the spray deposition of the metal layer and to enable the article to be released from the mould. The release layer should be of a material which remains substantially unaffected by the spray coating process so that the metal layer has a smooth interface with the release layer. A material which has been found suitable in the spray deposition of aluminium or zinc is polyvinyl alcohol. When a release layer of this material is used the article can be released from the mould by dissolving the polyvinyl alcohol in water.

[Price 4s. 6d.]

Suitable plastics materials are epoxy and polyester resins which may be impregrated with reinforcing materials.

The invention will now be described with reference to the accompanying drawings which illustrate successive stages of a method of making a metal coated article in accordance with the invention.

In the example described below the article is a prototype mould for an injection moulding machine. It is desirable to be able to make moulds capable of use a relatively small number of times cheaply and quickly so that a part can be tested before investing in a costly conventional mould.

Referring now to Figure 1, a mould 10 is constructed from wood or other easily worked material and coated with a release layer 11 of polyvinyl alcohol. The release layer may be applied by spraying on a solution of polyvinyl alcohol and allowing the solvent to evaporate.

A metal, for example, zinc or aluminium is then sprayed over the release layer 11 to form a metal layer 12 shown in Figure 2 about 5 thousandths of an inch in thickness. The exposed surface of the metal layer 12 is rough and porous but the interface with the release layer 11 is as smooth as the surface of the release layer.

The metal spraying process is conventional and commercially available equipment such as a "Metco" (Registered Trade Mark) E-8 spray gun.

An article 13 of plastics material is now formed in the mould as shown in Figure 3 using an epoxy resin or a polyester resin. The plastics material may be reinforced with fibre-glass, or asbestos or metal particles. The rough surface of the sprayed metal layer 12 ensures an excellent bond between the metal layer 12 and the article 13.

The article 13 is then released from the mould by dissolving the polyvinyl alcohol of the release layer in water. As shown in Figure 4 the metal layer 12 forms a coating on the article which improves the surface hardness and finish of the article.

An article prepared by this process is well suited for use as a prototype mould for an injection moulding machine and as a mould for blow moulding, compression moulding, and transfer moulding of plastics material.

WHAT WE CLAIM IS:—

1. A method of making a metal coated article including:—

(a) coating a mould with a release layer;

(b) spraying a metal coating on the release layer;

(c) forming an article of plastics material in the mould; and

(d) releasing the article with the metal coating on its surface from the mould.

2. A method as claimed in claim 1 in which the plastics material is an epoxy resin.

3. A method as claimed in claim 1 in which the plastics material is a polyester resin.

4. A method as claimed in claim 2 or claim 3 in which the plastics material is impregnated with a reinforcing material.

5. A method as claimed in claim 4 in which the reinforcing material is fibre-glass.

6. A method as claimed in any one of the preceding claims in which the article is released from the mould by dissolving the release layer.

7. A method as claimed in claim 6 in which the release layer is polyvinyl alcohol and the release layer is dissolved in water.

8. A method as claimed in any one of the preceding claims in which the metal is aluminium or zinc.

9. A method of making a metal coated article substantially as hereinbefore described with reference to and as shown in the accompanying drawings.

10. A metal coated article made by the method claimed in any one of the preceding claims.

11. A prototype mould for an injection moulding machine made by the method claimed in any one of claims 1 to 9.

PETER ORTON
Chartered Patent Agent

Printed for Her Majesty's Stationery Office by The Tweeddale Press Ltd., Berwick-upon-Tweed, 1969.
Published at the Patent Office, 25 Southampton Buildings, London, W.C.2, from which copies may be obtained.

1,167,690
1 SHEET

COMPLETE SPECIFICATION

This drawing is a reproduction of the Original on a reduced scale.

Fig. 1

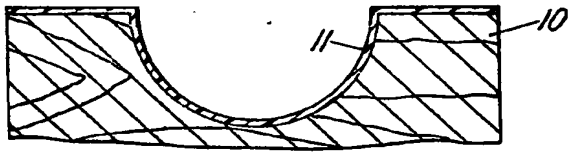

Fig. 2

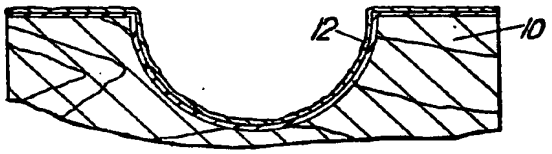

Fig. 3

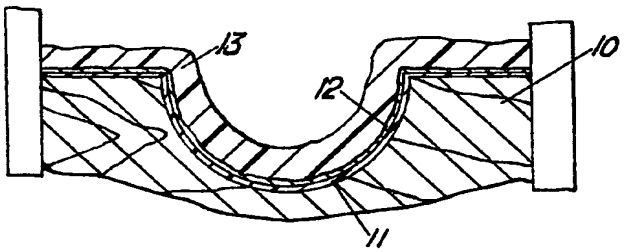

Fig. 4